Citrus Industry

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STACKS

1952-53 Season Nears Close

With the 1952-53 Florida citrus season nearing its close, most orange growers may close their books with a fairly good balance in black. The limited amount of fruit still on the trees is being rapidly consumed by the frozen concentrate and other processing plants at reasonably good prices, affording a reasonable profit to the producers. As regards grapefruit, the situation is not so good. With Florida in practical control of the grapefruit supply this is an anomolous situation and it is evident that Florida grapefruit growers must take some action to remedy the situation and increase consumption if they are to reman in profitable business — or, as one prominent grower puts it: "If they are to remain in business." Increased advertising and sales promotion appears to be the one solution.

This Month

Citrus Insect Control For June, 1953
Florida Citrus Fruits By Counties
The First Citrus Juice Extractors
Parathion For Control of Purple Scale On Early Varieties of Oranges
Scraps From My Notebook — Part III
The Citrus Outlook and Production
Citrus Doings In California

L. 34, No. 6 — Bartow, Florida — June, 1953

PARATHION-protected trees . . . are healthier trees

here's why . . . . . .

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Less leaf drop

Less dead wood

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no matter what time of year you apply parathion, you get all these advantages:

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Consult local agricultural authorities for suggestions on dosages and application procedures.

AMERICAN Cyanamid COMPANY

Manufacturer of Thiophos® Parathion Technical

Agricultural Chemicals Division
Brewster, Florida

Write for New Parathion Grower's Handbook

Citrus Insect Control For June, 1953 . . .

W. L. THOMPSON AND R. M. PRATT*
FLORIDA CITRUS EXPERIMENT STATION, LAKE ALFRED

Purple scale infestations on old leaves have reached the highest point in the three seasons of the record, and the average infestation is also increasing rapidly on the Spring flush leaves. It appears that the serious purple scale situation will continue into June and July. Control measures should be timed carefully and applied thoroughly.

Red scale activity has been low during the Spring months, but a new hatch has started and activity is increasing. At this time there is no basis to expect an unusual Summer population, but this scale is capable of increasing very rapidly in infested groves.

There was a heavy mortality among purple mites during April, and at the end of the month the population was low on both old and new leaves. During May, however, the infestation has doubled and activity is now high and increasing rapidly. The peak of activity will probably be reached during June.

Rust mite activity has been high during May, and while it is declining at the time this is written, further increase during June is expected. Care must be taken to avoid letting the rust mite population get out of control during the season when the major emphasis is on scale control.

Six-spotted mites have been more than usually abundant this Spring, but the damage has not been as great as the number of infestations might indicate. They are abundant and causing fruit drop in some groves. Infestations are most numerous in the Indian River District. Where they are abundant, parathion should be used and the application made as soon as possible.

Black scale, which is seldom an economic problem in Florida, is present in more than half the groves checked, and in some it will probably require control. The application must be timed to kill the young stages, which are found on leaves, green twigs, and fruit, since the adults cannot be controlled with either oil or parathion.

Whiteflies are fairly abundant this year, but they will be kept under control by an adequate scale control program.

SPRAY PROGRAMS

From all indications most of the insects and mites of economic importance will be quite active during June. Several species of scales are present in some groves, along with infestations of mealybug, whitefly, rust mites and purple mites. Care should be taken in checking groves to determine which insects are present, the correct insecticide to use, and the most opportune time for the application of an all around control program.

The application should be timed for the control of the insect pests that are most threatening in the grove. Most insects are easily killed in the younger stages, but some are much more difficult to kill in the more advanced stage of growth than others. For instance, the intermediate and adult stages of black scale and mealybugs are more difficult to kill than the advanced stages of purple scale. Whitefly pupa (stage just before emerging as adults) are very difficult to kill with oil or parathion, but the young larvae are very easily killed with either of these insecticides.

This year some groves should be sprayed fairly early in June to check black scale and mealybug infestations. However, where these two species of insects are not a problem, the most satisfactory control of purple and red scale will be obtained where the sprays are applied after the middle of the month, because, at that time, there should be a high percentage of young stages. Where post-bloom scalicide application was effective, the Summer application can be delayed into July or later if parathion is to be used.

Due to the early bloom, oranges should be large enough in the average grove to spray with oil by June first, but examination of the fruit should be made to see if the oranges are at least 1½ inches in diameter before any oil application is made. Also check to see if the soil has plenty of moisture before applying oil. Sulfur in any form is more likely to burn during hot weather where applied on trees that are suffering for moisture. Parathion may burn young succulent foliage and if there is any quantity of Summer growth, it is advisable to wait until the growth has nearly matured before a parathion application.

Scale Control: Where either red scale or black scale infestations are heavy, time the scalicide application after the peak hatch of eggs. It is also advisable to apply scalicide when there is a high percentage of young purple scale, but if either black or red scale are present, time the spray for those two species. Either an oil emulsion at 1.3% actual oil or parathion at 1 2/3 pounds plus 5 pounds of wettable sulfur per 100 gallons can be used. On tangerines a 1.0% concentration of oil is safer than 1.3% or the usual amount of parathion can be used.

Mealybug Control: Mealybugs are now in masses on the fruit stems, between fruit hanging in clusters and between leaves that are touching. Only fair control can be expected with any material, but a very thorough application of parathion at 1 2/3 pounds per 100 gallons is recommended. Oil sprays are not very effective except in killing crawlers. Parathion will also kill the pink scavenger worm that is usually associated with a mealybug infestation. This worm sometimes eats into the peel of the fruit which causes it to drop or be a cull.

The peak of whitefly is usually over by mid-June and either an oil emulsion or parathion is effective. Thorough coverage of the undersurfaces of the leaves is necessary for satisfactory control. If the whitefly is effectively controlled in June, there should be very little sooty mold on the leaves during the remainder of the year. Where a heavy coating of sooty mold covers the leaves, an oil emulsion will cause most of it to slough off.

Oil emulsions are the most effective sprays for purple mite control. Either the 1.3% concentration used for scale control or about 3 quarts of oil emulsion and 1 pound of parathion are effective for scale and purple mite control. Ovotran, Orthotran, or Niagaratran are effective and can be used in combination with parathion and wettable sulfur.

Rust Mites: Rust mite infestations should be kept at a minimum this Summer to avoid excessive greasy

(Continued on Page 18)

*Written May 25, 1953. Reports of surveys by Harold Holtsberg, Cocoa; J. W. Davis, Tavares; K. G. Townsend, Tampa; J. B. Weeks, Avon Park; and T. B. Hallmon, Lake Alfred.

Mutual Predicts Profitable Finish

Florida Citrus Mutual on May 12 stated that growers can be assured of "finishing the present season with continuing steady prices" following a reduction in the Federal crop estimate on Monday.

Mutual said it could "see no reason for growers to be at all apprehensive about profitably disposing of their remaining fruit."

The statement followed the latest United States Department of Agriculture crop estimate in which 200,000 boxes were lopped off the Early and Midseason estimate and one million boxes were added to the estimate on March seedless grapefruit.

According to the estimate, 13,730,000 boxes of oranges remain in the present crop from the total estimate of 74,800,000 boxes. At the same time last year, 12,277,900 boxes of the total of 78,600,000 boxes remained. The difference in this year's utilization figure compared to last year's is generally attributed to the long waiting period between the Midseason crop and the time Valencias reached the proper sugar-acid ratio.

Mutual's statement pointed out that last season from here on out, "concentrators utilized 7.7 million boxes. This season, for the same period, we believe they will utilize 8.9 million boxes which will give the industry a total pack of 47.4 million gallons, compared to 44 million gallons last season."

It continued, "Again, from here on out, 4.2 million boxes of Valencias were utilized in fresh form last season and this year for the same period we believe that 3.9 million boxes will be utilized. The known concentrate capacity during the past eight to ten weeks has not been approached. Yet, during the past three weeks, total utilization by all outlets has been about 2.5 million boxes per week."

Mutual said that in comparison to last year, the crop this season is 3.8 million boxes. "It must be remembered that we have on hand now about a million boxes more than on the same date a year ago," it concluded.

The Federal estimate raised the grapefruit on hand to 1,938,000 boxes including 591,000 boxes of seeded and 1,347,000 boxes of seedless.

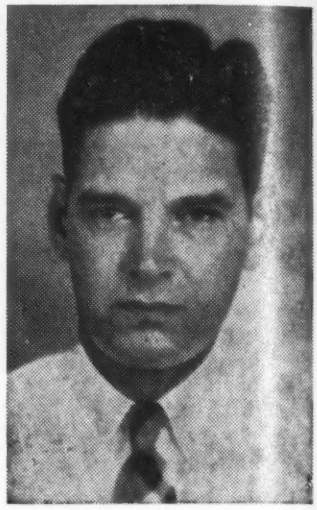
This represents 5.9 per cent of the total estimate of 32,500,000 boxes compared to 23.9 per cent of the 36,000,000 boxes on hand at this time last year. Three million boxes of last year's crop went unpicked for lack of a market.

Crum Receives Scholarship

John F. Crum, of Brooksville, has been awarded the Florida Citrus Exchange annual $1,000 scholarship in cooperative marketing at the University of Florida, it was announced in Tampa on May 1 by Armer C. Johnson, of Mount Dora, chairman of the Exchange scholarship committee.

The award, established in 1948, is made by the Exchange each year to an outstanding graduate of the College of Agriculture who desires advance education in the field of cooperative marketing.

Crum, a 36-year-old Marine veteran of World War II, graduated from Her-



nando High School in 1934 where he was active in sports. He attended Carson-Newman College in Tennessee, Florida State University, and the University of Florida.

Before entering the Marine Corps in 1939, Crum became interested in the citrus industry through work performed in packing houses and canning plants in the Brooksville area. Following completion of graduate work at the University of Florida, he expects to enter employment in the field of citrus research and economics.

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Representing no special interest

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Florida Citrus Fruits By Counties . . .

CITRUS SUMMARY

HISTORY—1/

The fruit from citrus trees has long been a food for man. Seeds from the Orient were carried by early travelers to the Mediterranean area and from there Columbus brought the first citrus seeds to the Americas on November 22, 1493. Other expeditions also brought along citrus seeds, and between July 12 and July 20, 1518, the first were planted on the mainland in Central America by the expedition of Juan de Grijalva.

The exact date of the introduction of citrus fruits into Florida is unknown. From a statement made by Petro Medendez, dated April 2, 1579, at St. Augustine, it appears that citrus fruits were growing in abundance there at that time, so it is justifiable to assume that they were brought by the first settlers in 1565.

Early settlers in Florida, some two centuries later, found wild citrus groves scattered over the State.

The oldest cultivated grove planted in Florida (Hume, 1926, p. 95) is thought to be the Don Phillipe grove situated near what is now Safety Harbor in Pinellas county, planted some time between 1809 and 1820.

1/ See the Citrus Industry by Webber & Batchlor, pages 19, 22, 25, 27.

This data is taken from the Annual Summary prepared by Paul E. Shuler, Citrus Statistician, and J. C. Townsend, Jr., Agricultural Statistician, in charge Florida Crop and Live Stock Reporting Service, Orlando, Florida—Editor.

PRODUCTION

The growth of the Florida citrus industry was spasmodic until 1894-95 when the Great Freeze hit Florida. That year production had climbed to 6 million boxes, which was almost totally wiped out by the Freeze. Fourteen years passed before Florida equaled this production again.

By 1919-20 Florida had 84,100 acres in bearing commercial groves. This was 30 percent of the total citrus acreage in the United States and on which Florida produced 39 percent of the total United States citrus by harvesting 13,928,000 boxes. When Florida surpassed all other States in citrus acreage in 1932-33 with 265,400 acres, it accounted for 46 percent of the United States total acreage. By 1951-52, Florida's 454,700 acres of producing groves were producing more than two-thirds of the citrus produced in the United States on 58 percent of the total United States acreage. This was 119,360,000 for Florida out of United States total of 175,910,000 boxes. During this period of Florida's citrus history other areas also increased in production. In 1919-20 California accounted for 60.3 percent of the total United States production, but by 1951-52 had dropped to 30.2 percent of the total United States production with 53,130,000 boxes, which was the second smallest crop from California since 1936-37. California's largest crop was produced in 1944-45 with 76,880,000 boxes produced. Texas had a phenomenal expansion of citrus acreage between 1920-21, when only 600 acres were planted, to 1948-49 with its 122,500 acres. Most of this acreage was grapefruit. Then came the freezes of 1949-50 and 1950-51. The Texas citrus acreage for 1951-52 as shown at 17,700 acres of oranges and 17,900 acres for grapefruit (and 300 acres for tangerines, lemons and limes) are based on a derived figure useing 65 trees per acre and trees of 5 years and older as reported by United States Department of Agriculture, Bureau of Entomology and Plant Quarantine July 1, 1952. Their report is as follows:

NOTE: Net contents of box varies. For California and Arizona, 77 pounds for oranges, 65

to 68 for grapefruit. Florida and other States use a larger box with oranges 90 pounds and grapefruit 80 pounds.

Of the 6.8 million grapefruit trees, 3.7 million or 55 percent are seeded type and nearly 3.1 million or 45 percent are seedless

Kind of tree	Number of growing trees of age						TOTAL
	0	1	2	3	4	5	5+
White Grapefruit	1,674	2,667	1,211	1,904	5,896	663,708	677,060
Pink Grapefruit	75,834	47,232	76,243	278,333	189,291	408,286	1,165,219
Oranges	77,474	56,664	95,936	225,878	202,040	1,149,616	1,807,608
Tangerines, Lemons and Limes	190	1,542	195	36	7,372	20,251	29,586

TREE NUMBERS

It is estimated that there are nearly 29.6 million producing citrus trees growing in commercial groves in the State of Florida. Of these, 20.9 millon are orange trees of which slightly more than 12.0 million, or 58 percent, are early and mid-season type. Of the total orange production of 78,600,000 boxes in 1951-52, 43,800,000 boxes or 56 percent were early and midseason type. Late type orange trees number slightly more than 8.9 million, or 42 percent of orange tree total, and accounted for 34,800,000 boxes or 44 percent of the orange production.

type. Seeded type accounted for 18,300,000 boxes or 51 percent out of a total of 36,000,000 and seedless type produced 17,700,000 boxes or 49 percent of the total grapefruit.

Tangerines accounted for approximately 4 percent of the total citrus production in 1951-52, with a little less than 1.5 million trees.

Lime trees accounted for 5,500 acres and produced 260,000 boxes in 1951-52.

NON-BEARING ACREAGE

It is estimated that as June 30, 1952, there are 70,800 acres of non-bearing citrus trees planted in Florida. This means that for the next four years there will be added to the bearing acreage of Florida citrus an average of approximately 17,700 acres per year, and by 1956 Florida bearing total citrus acreage will be approximately 525,000 acres.

PRICES

Prices have varied from the lows of the late thirties, when for the season of 1938-39 the equivalent on-tree from all methods of sale returned 22 cents per box for grapefruit, to the high of 1949-50 when equivalent on-tree return for grapefruit, all methods of sale, climbed to $1.79 per box, but declined in the 1951-52 season to 53 cents. Oranges varied from on-tree equivalents for all methods of sale of 52 cents in season of 1939-40 to a high of $2.37 in 1945-46 and were 76 cents per box in the 1951-52 season.

Estimated County Production 1951-52

County	Early & Midseason ORANGES Bearing Trees (000)	Early & Midseason ORANGES Production (000)	Late (Valencia ORANGES Bearing Trees (000)	Late (Valencia ORANGES Production (000)	TOTAL ORANGES Bearing Trees (000)	TOTAL ORANGES Production (000)
1. Polk	2,197	8,266	2,439	10,876	4,636	19,142
2. Orange	1,978	8,063	1,190	5,029	3,168	13,092
3. Lake	1,578	6,310	866	3,558	2,444	9,868
4. Highlands	321	1,156	502	2,324	823	3,480
5. Hillsborough	691	2,253	473	1,457	1,164	3,710
6. Volusia	559	2,452	237	1,096	796	3,548
7. Pinellas	236	669	259	929	495	1,598
8. St. Lucie	403	1,093	429	1,009	832	2,102
9. Pasco	389	1,137	464	1,558	853	2,695
10. Indian River	243	608	253	542	496	1,150
11. Marion	611	2,384	61	252	672	2,636
12. Hardee	481	1,627	211	909	692	2,536
13. Brevard	533	1,250	264	525	797	1,775
14. Seminole	302	1,245	109	460	411	1,705
15. DeSoto	321	1,047	136	545	457	1,592
16. Manatee	142	268	135	474	277	742
17. Osceola	179	708	80	355	259	1,063
18. Putnam	241	803	45	166	286	969
19. Lee	88	164	94	260	182	424
20. Sarasota	94	179	74	247	168	426
Other Counties	490	2,118	539	2,229	1,029	4,347
STATE TOTAL	12,077	43,800	8,860	34,800	20,937	78,600

County	ALL GRAPEFRUIT Bearing Trees (000)	ALL GRAPEFRUIT Production (000)	TANGERINES Bearing Trees (000)	TANGERINES Production (000)	TOTAL Bearing Trees (000)	TOTAL Production (000)
1. Polk	2,035	13,088	355	1,267	7,026	33,497
2. Orange	408	2,323	206	694	3,782	16,109
3. Lake	645	3,308	154	518	3,243	14,294
4. Highlands	354	2,634	51	142	1,228	6,256
5. Hillsborough	229	1,099	64	186	1,457	4,995
6. Volusia	92	479	154	440	1,042	4,467
7. Pinellas	498	2,513	38	124	1,031	4,235
8. St. Lucie	487	1,826	54	112	1,373	4,040
9. Pasco	170	875	43	107	1,066	3,677
10. Indian River	610	2,043	22	39	1,128	3,232
11. Marion	58	328	14	44	744	3,008
12. Hardee	55	301	42	139	789	2,976
13. Brevard	240	779	32	58	1,069	2,612
14. Seminole	49	286	49	171	509	2,162
15. DeSoto	90	365	32	98	579	2,055
16. Manatee	230	723	4	17	511	1,482
17. Osceola	49	257	28	92	336	1,412
18. Putnam	26	117	38	91	350	1,177
19. Lee	97	274	4	17	283	715
20. Sarasota	57	159	1	5	226	590
Other Counties	301	1,623	97	139	1,427	6,109
STATE TOTAL	6,780	36,000	1,482	4,500	29,199	40,500
STATE ORANGE TOTAL						78,500
STATE TOTAL ALL CITRUS						119,100

USDA'S NEW ORANGE JUICE POWDER IS OF INTEREST IN FLORIDA

An orange powder dissolving instantly in ice water and producing juice with the flavor, color and nutritive value of fresh orange juice, announced recently by the U. S. Department of Agriculture, is attracting considerable interest in Florida.

The concentrate is produced from orange juice containing a high percentage of soluble solids. The powder is made by pouring orange juice into metal trays and placing them in a vacuum chamber.

Controlled pressure and temperature during drying forces the concentrate to puff up as much as 20 times its original volume. This open sponge-like structure can easily be broken into a fine flaky powder, dissolving readily in water.

Fresh orange flavor lost during the drying process is restored by adding natural orange oil and sorbitol, an edible material which locks in the flavor until the powder is dissolved.

The powder is sealed in tin cans, along with a small package of drying agent which absorbs most of the moisture left in the powder. The new powder can be stored with other staple foods.

Scientists are also testing the juice of other fruits and vegetables for possible use by this method. The new orange powder is not yet commercially available, but is expected on the market soon.

Fifteen Pasco County farmers are growing extensive acreage of Alyce Clover this season, according to J. F. Higgins, County Agent.

Mutual To Open New Membership Campaign June 1

An all-out membership campaign with a goal of at least 450 new Florida citrus growers as members will be launched on June 1 by Florida Citrus Mutual.

The campaign will run through the month of June.

Mutual is leaning heavily on its 40 "grass roots" Grower Councils to make the drive a success.

In a letter to all Council officers, Robert W. Rutledge, Mutual general manager, called the campaign an "opportunity to do one of the things you have indicated you wanted."

Mutual at present has approximately 6,800 grower members. It reached a peak in membership shortly after coming into existence five years ago with slightly more than 7,000 members. The membership total changes constantly, because of deaths and sales of groves. In such instances, Mutual membership does not automatically extend to the estate or new owner.

Although the goal of 450 new members may be considered "amibitious," Rutledge said, "we confidently expect the total will be even higher at the end of the month-long campaign. If each of Mutual's 40 Councils accounts for only 15 new members, the total will be 600 and the goal will be surpassed."

Hard-working campaign workers will be rewarded. The awards include a trip to the New York auction for a representative of each of the three Grower Councils securing the most new members percentage-wise; a special award to the individual who signs the greatest number of new members and a special citation for the Grower Council with the highest total of new members.

Announcement of the campaign has brought scores of offers of help from growers who are not Council officers but want to make their organization as strong and representative as possible.

"Mutual's effectiveness — its ability to help stabilize the complex Florida citrus industry and enable its members to receive the true value of their crops — is in direct ratio to the number of growers it represents," Rutledge pointed out.

"We now represent approximately 85 per cent of the state's production, but we could do a far more effective job if we could bring in another 10 per cent. In unity there is strength and the more growers Mutual represents, the louder the voice with which it can speak in their behalf."

OUTSTANDING WORK WINS TRIP FOR MANATEE GIRL

Miss Vera Jo Neff, one of four Florida 4-H club members chosen to attend the National Club Camp in Washington, June 17-24, has an outstanding record in both projects and leadership, according to Mrs. Anne D. Davis, Manatee County home demonstration agent.

Currently president of the State Council of Junior Home Demonstration Work, Miss Neff has been secretary of this organization and also has been reporter, treasurer, vice-president and president of her local club.

In 1951 she won a trip to the National Club Congress in Chicago for her outstanding clothing achievement.

The First Citrus Juice Extractors

C. C. STREET

The first commercial citrus juice extractors were built at Haines City, Florida, by my father, the late C. E. Street, and myself during the Summer and early Fall of 1915 at the first citrus juice plant established in Florida.

This first citrus juice plant (we called it a by-products plant in those days) was built and operated at Haines City, Florida, under the corporate name of Florida Fruit Products Company, Inc. My father organized the corporation after interesting a few Polk County growers in supplying a portion of the capital. He then completed his production designs, installed the equipment, and operated the plant under processing procedures which he had developed in his personal experimental laboratory at Avon Park, Florida.

Officers and Directors of the corporation (all deceased) were: E. C. Stuart, Bartow, Chairman of the Board; J. W. Sample, Haines City, President, Dr. Mart Sample, Haines City, Secretary and General Manager.

A rented building, which still stands directly across the railroad tracks west of the Haines City depot, was used during the first season's operations of this original citrus juice company. The building was fully outfitted with new processing equipment and special machinery. The plant opened in January 1916 and operated through the 1915-16 fruit season. Grapefruit supplies were received from packing houses throughout the ridge section of Polk County and from growers in the immediate area. The pure juice of tree-ripened grapefruit was processed in this first plant in a manner somewhat similar to the processes in use at the present time except that bottles were used as containers instead of cans. At that time the can-making industry had not yet produced cans with a sufficiently heavy coating of tin plate to hold citrus juice under hermetic seal.

During the summer of 1916, while the original plant was producing Guava Juice to be made later into Guava Jelly, our staff of engineers were busy designing and building a new processing plant which, in later months, was to become the new home and production plant of Florida Fruit Products Company, Inc. This plant, a four story brick building, was built adjacent to the A. C. L. Railroad close to the Florida Citrus Exchange packing house at the southwest city limits of Haines City.

Many problems were confronted in designing and building the necessary special machinery to be installed and operated in these first two plants. No standard equipment such as we have today in the canning industry was available at the time. We were able, however, to adapt a few machines from other lines of industry to the specialized work required. For instance, we used a standard Troy laundry centrifugal clothes-dryer to remove the heavy pulp and seeds from the juice. These Troy machines were operated in a battery and the juice had to enter each machine in batches and remain for a required length of time.

From these machines the juice flowed through DeLaval cream separators for further finishing. These were standard machines in the milk industry as were also a battery of steel glass-lined settling tanks where the juice was allowed to remain for a period of time under cold storage for final clarification.

Not the least of our unsolved problems during those early years of citrus juice production was the development of mechanical means to extract the juice from grapefruit and oranges. Through the years many and various mechanical and semi-mechanical devices were built, tested, and discarded. Machinery manufacturers finally became interested, and in about 1927 the first completely automatic juice extractor was offered to the industry. The mechanism of this automatic machine was not highly perfected at first and many canners were forced to continue on with variations of the hand reamer which was an out-growth of the first extractors built by my father and myself at Haines City in 1915 and 1916.

Much could be written concerning the various stages of developing a satisfactory juice extractor in the citrus canning industry. The ground to be covered would deal with the primary need, the early devices used, the application of power, improved mechanisms, shape and design of reamer heads, acid resisting metals, fruit handling, flow of the juice, man-power, horse-power and sanitation. The text would deal also with costs, investment losses, and the developers who labored and pioneered in the industry. Mention would be made of the operators who toiled with sore wrists while the juice dripped off their elbows, of waste and inefficiency, and many other phases of the evolution that led, step-by-step, to the highly perfected, fully-automatic, ultra-machinery now available to the industry. Modern machines, which operate just short of perfection, are now installed and maintained by nationally-known machinery manufacturers leaving only the problem to Mr. Canner of paying his royalty bill which is computed from the gallons of juice produced by each machine.

The long road of development work in producing a mechanical citrus juice extractor had its beginning when my father finally completed his plans to establish a juice plant at Haines City. He said he was going to "conserve" a portion of the grapefruit crop so the juice could be shipped to wider markets for later consumption. He did not use the word "preserve" because he said that conflicted with fruit and marmalade preserves. It was not a "bottling plant" in the strict sense, yet we used bottles as containers for the juice. The word "cannery" could not be used correctly since cans were not yet available in the industry. Hence, the factory (my mother called it a "factory") was simply referred to as a "juice plant" — and that designation remains in common use today.

To test out my father's processes for "conserving" grapefruit juice at his experimental plant in Avon Park we peeled each fruit by hand and pressed the juice from the fruit by mashing the pieces between two boards. One board was attached to a work bench with grooves cut in it so the juice would drain into a bucket. A second board was hingd on top of the first board with an extended handle so we could exert pressure when the fruit was being pressed.

We knew the day was coming when this crude device would have to give way to the "machine age." Yet the process must be devloped first, and in my father's theory of putting first things first we did not get around to

the mechanical juice extractor until the "juice plant" became a certainty at Haines City.

Necessity is the Mother of Invention. This was not a new phrase when my father mused over the words. But the application was new for we were starting to construct a device that would remove the juice from grapefruit and oranges without having to exert 100 percent man-power to the task. Speed and efficiency were also part of our goal. There was no previous experience or past performance to guide us. We were undertaking to build a new machine for a new use. Our scheme had to be creative.

Among my mother's kitchen possessions was an odd-looking wooden lemon squeezer. It was fashioned similar to a darning egg which is used when darning socks, but the head was grooved so it would cut into a half lemon and tear out the juice cells. My father said, "I believe this 'trick' holds the answer to our problem; we will reproduce it in metal, mount it on a spindle, and spin it mechanically." There we had the idea and an image in our minds of what we were trying to build.

My father made a mechanical drawing of the head of this lemon squeezer but enlarged it sufficiently to handle a half grapefruit. We had to give it a name so it was known on the drawing as a "reamer head," which is a standard term today. A pattern was made and the first castings were produced at a foundry in Orlando.

A copper clothes boiler, which was commonly used in those days, served as a receptical in which the reamer heads were mounted so the flying juice from the reamer heads could be collected and drained out at a given point. The copper clothes boiler was cut down from its original heighth of about eighteen inches to a depth of seven or eight inches so an operator could reach the reamer heads easily. The boilers were oval in shape and sufficiently large to accomodate two reamer heads, thus permitting an operator to use both hands.

A semi-mechanical juicing machine was now beginning to take shape. The remaining problem was to mount the reamer heads in the boiler so they could be revolved mechanically. This was accomplished simply by cutting small holes in the bottom of the boiler, then anchoring improvised bearings with rivets and solder to hold and support a short piece of round shafting which extended through the bottom of the boiler. The reamer heads were attached to the top end of the shafting and a small grooved pulley was mounted on the lower end. The spinning action was derived by looping a sewing machine belt around each pulley and then around another pulley mounted on a counter shaft close by. This counter shaft was driven through a series of belts by a steam engine located in the rear of the building.

The apparatus worked. The reamer heads cleaned out the juice cells from half a grapefruit to perfection. One man (usually a boy) could develop fairly good speed by applying the grapefruit halves to the reamer heads with both hands. We were satisfied temporarily with speed and efficiency, but what about sanitation? After all, the juice itself did not come in contact with human hands so we had only one problem to overcome. The metal parts must be plated with a coating impervious to the acid of the citrus fruit.

Acid resisting metals now in common use throughout the industry were unavailable. Our only solution was to have all the metal parts either silver plated or pickled with a heavy coating of tin. In due time this was accomplished and by the time the plant was ready for operation, we had four or five shiny new reaming machines installed and ready for use. We felt that the name "reaming machine" was not dignified enough now that they were so pretty and they did the work so well. We had not yet started to figure production costs, but labor was cheap and there was no point in borrowing trouble which would come soon enough with the future. The reaming machines extracted juice from citrus fruit so why not call them "citrus juice extractors." That was a better name—and it prevails today.

When the new plant was built at the city limits of Haines City during the summer of 1916, it was decided that everything must be modern. This meant that new "juice extractors" must be built. Time did not permit changing the design or principal of the original machines but improvements could be made. We were still dealing with speed, efficiency, and sanitation.

By the end of the summer we had a compact assembly of reaming heads mounted in unison around a circular table to accommodate ten operators. No basic changes had been made except that the grapefruit halves were deposited in the center of the table so each operator could have a continuous supply. Instead of cutting the grapefruit in two halves with a large knife as had been done the previous season, we now arranged a device to cut the grapefruit in halves with a revolving knife as the fruit rolled single file down a chute. This attachment increased the speed and efficiency of the entire operation and became a standard practice as long as hand operated extractors were in use.

The new assembly of juice extractors was mounted on a mezzanine in the top floor of the plant and was supplied by fruit which came up from the basement (four floors below) by means of an endless bucket elevator. This high elevation at the point of extraction provided a gravity flow of the juice throughout the plant and, of course, the refuge and peel from the extracting table came back to the ground floor by gravity.

Our one source of power in the plant was a ninety horse-power steam engine located in the basement of the building. Through a series of belts and counter shafts we were able to provide the needed transmission power on each floor. No individual motors were available then. When the engine was started in the basement, the entire plant jerked into motion—even the reaming heads which were almost on the roof. It would have been an inspiration to Rube Goldberg if he could have seen the mass of belts and jack-shafts under the juice extracting table.

This sketch of our early activities at Haines City would not present a true account of the toil and determination involved without giving prominent mention to the technical work accomplished and the man who pioneered this elusive task. Putting machines together and making them work did not constitute our whole problem. By trial and error the proper results could be obtained in processing methods—but we had to know why. Controls, reference files, a log of technical data were essential. Research was in the making here and we could not tell where we were going unless we knew where we had been. Laboratory technique must be applied. A myriad of hidden problems must be overcome by tabulating our own mistakes and achievements.

With these conclusions in mind an effort was made to establish this new department under capable direction. The post was filled by Mr. Seth S. Walker who joined us early in 1917 after resigning his position with the College of Agriculture at the University of Florida, where he had been associate chemist in the Agricultural Experiment Station. Mr. Walker's work at Haines City, his accomplishments and accumulated experience over the years, characterize his invaluable contribution to the citrus processing industry. He devoted his

(Continued on Page 18)

Scraps From My Notebook . . .

. . . By . . .

Gray Singleton

CITRUS TABLE SYRUPS

Part III.

Most of us like hot cakes for breakfast. We like buckwheat cakes, served hot, with plenty of butter and syrup. We like hot biscuits or buttered toast with syrup. Most of us who are not alcoholics like something sweet for breakfast.

In Florida, and in all the United States for that matter, we buy and consume enormous amounts of table syrup. Yet, here in Florida, with all of our raw materials for syrup making, we produce almost no syrup at all. We buy it from other states. What we do make is mostly of an inferior grade and is largely synthetic.

There was a time when nearly every farmer in Florida had a cane patch. In the fall of the year cane grinding was a festive occasion. We made syrup, drank cane juice and courted, all at the same time. When cane grinding was finished and the cans filled with liquid sweetness were stacked in the barn, the farmer would take a few gallons to town on Saturday and trade them for other groceries. Most of this cane syrup was an excellent product and a fine source of carbohydrate food for energy.

But, a few years ago, the corn stalk borer hit Florida and practically ended this making of cane syrup. The worm bored into the lower part of the cane stalk. We could cut off and discard that part of the cane containing the worm but the whole stalk had a flavor which ruined the syrup. Thus we lost a dependable source of farm income and one of our best foods.

The synthetic and blended syrups which came in to replace pure cane syrup were mostly invert sugar or dextrose syrups. Some were blended with pure cane or maple syrups and some were pure synthetics, colored and flavored to imitate the real product. These syrups have two qualifications to recommend them. They are cheap and sweet.

About twenty-five years ago I reasoned that orange juice has about the same sugar content as cane juice and, if concentrated to the standard Brix of commercial syrup, might make a tasty addition to our breakfast menu. I had five small groves at the time and could not sell the fruit for enough to pay cost of production. I wanted a profitable way to market my crop. A lot of growers are still looking for the same thing.

Following up this idea I picked a bushel of oranges, extracted the juice on a hand reamer and boiled the juice, just as I had made cane syrup. I was careful not to get peel oil in the juice because I thought that it would ruin the syrup.

The result was not too good. I had overlooked the important fact that orange juice contains acid as well as sugar. When the juice was boiled the acid, as well as the sugar, was concentrated. The syrups was very sour. To be more specific, titration against standard alkali showed that the syrup had almost exactly the same acidity as lemon juice. Also, it had almost no orange flavor. Most of the flavoring constituents of orange juice are volatile and had disappeared with the steam during prolonged boiling.

I knew that I could not sell sour syrup so I tried adding sugar to the juice to dilute the acid, boiling just enough to sterilize, skimming off the foam, as we did with cane syrup, and canning it. This product was somewhat better. It was not so sour but it was thin and watery and did not have enough orange flavor to warrant putting it on the market as a commercial item.

I made up dozens of batches of orange syrup and did not get one that was really good until one day when I was making orange marmalade. Before the cook was finished I noticed that the syrup in the marmalade had excellent body. It was not thin and watery as the other batches had been. It had good color and flavor. The only difference was that the marmalade contained peel that was not in the syrup. Pectin in the peel gave body to the syrup and peel oil and other peel constituents gave flavor and color. I had been so careful to keep peel out of the syrup and peel was what I needed all the time.

After observing the syrup in the marmalade I made up batches of syrup with varying amounts of peel and sugar. The best formulation seemed to be:

1 Gallon orange juice.
2 Pounds ground orange peel.
15 Pounds cane sugar.

This make 12 No. 2 cans of syrup, or 1.63 gallons.

In order to get the best flavor, color and body to the syrup the peel must be sliced into thin strips, as in marmalade, or ground. A meat grinder giving about quarter-inch particles is good. The sugar is dissolved in the juice while it is being heated. The ground peel is added and the whole is brought to a boil. The peel floats and, after boiling five minutes, is skimmed off, together with a yellow foam which collects on the syrup. If this yellow foam is well skimmed off the syrup will keep perfectly for about three years. If the yellow foam is not skimmed the syrup will, in a few months, taste like old canned orange juice.

It is best to select clean, bright peel for use in making syrup. Peel that has been injured by rust mites does not give much flavor.

The syrup holds its flavor best if not filtered. A small amount of pulp left in the syrup adds greatly to the taste appeal, particularly after two years storage at room temperature. The syrup turns dark in color and loses flavor during the fourth year.

Small scale consumer acceptance tests were run on orange, grapefruit and tangerine syrups which were made as described above. Acceptance and repeat sales were excellent on orange and tangerine but

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The Citrus Outlook And Production

J. C. TOWNSEND, JR.,
AGRICULTURAL STATISTICIAN,
U. S. BUREAU OF AGRICULTURAL ECONOMICS

The marketing of citrus fruits and vegetables continues active with the end of the 1952-53 season in sight. Mid-May finds the harvest of cabbage, snap beans and leaf crops well toward completion. Other spring vegetables, such as celery, sweet corn, cucumbers, peppers, potatoes and tomatoes have passed their seasonal peaks and will decline rapidly as June approaches. Watermelon harvest has become active and will be heavy in late May and June. Citrus marketings are in the usual seasonal decline.

CITRUS, 1953-54 PROSPECTS—Despite a very heavy bloom, the set of fruit for next season appears only moderate in a great many areas. Growers in reporting the condition of next year's crop for the first time reflect these conditions. **Oranges** at 69 percent of a full crop compare with 78 last year and 80 in 1951. **Valencias** are at 70 percent vs 77 and 79. All **grapefruit** at 68 is one point below 1952 and 7 below two years ago. **Tangerines** at 64 are 8 points below last year. The above early conditions point to the possibility of a smaller crop of oranges for the coming season and a grapefruit crop close to last year's production.

CITRUS, 1952-53 CROP — The Florida orange crop is now carried at 74.8 million boxes compared with 78.6 million in 1951-52. The early and midseason orange crop (including 1.7 million Temples) has been harvested and amounted to 42.3 million boxes, 3 percent less than last year. Valencias for 1952-53 estimated at 32.5 million boxes are 7 percent less than last year. As of May 10 about 13.7 million boxes remained. Grapefruit is expected to fill 32.5 million boxes this year, compared with 33.0 harvested and 36 million boxes produced in 1951-52. Less than 2 million boxes (mostly seedless) remain for marketing after May 10. **Limes** for 1953-54 are estimated at 290,000 boxes—about 10 percent less than last year.

CITRUS—The Nation's total orange crop for the 1952-53 season is estimated at 120.7 million boxes —2 percent above last season and 18 percent above average.

	PRODUCTION, 1,000 BOXES			MAY 1 CONDITION				
	1950-51	1951-52	1952-53	1949	1950	1951	1952	1953
ORANGES—Early and Midseason								
FLORIDA, a/	36,800	43,800	42,300	76	73	80	78	69
California	14,610	12,600	16,030					
Texas	1,800	200	700					
Arizona	650	350	400					
Louisiana, all	300	50	50					
5 STATES, TOTAL	54,160	57,000	59,450					
VALENCIAS								
FLORIDA	30,500	34,800	32,500	75	75	79	77	70
California	30,600	25,810	28,000					
Texas	900	100	300					
Arizona	750	380	450					
4 STATES, TOTAL	62,750	61,090	61,250					
TANGERINES								
FLORIDA	4,800	4,500	4,900	69	70	74	72	64
GRAPEFRUIT								
FLORIDA, ALL	33,200	36,000	32,500	64	65	75	69	68
Seedless	15,800	17,700	17,000	66	70	79	74	70
Other	17,400	18,300	15,500	62	62	72	67	66
Calif. Des. Valley	1,160	630	750					
Texas, all	7,500	200	400					
Arizona, all	3,150	2,140	2,700					
4 STATES, TOTAL	45,010	38,970	36,350					
LIMES								
FLORIDA	280	260	320					
May 1 forecast of 1953 crop			290					

a/ Includes following quantities of Temple Oranges, (1,000 boxes)—1950—1,100; 1951—1,700; 1952—1,700

The total grapefruit crop is placed at 38 million boxes—6 percent less than last season and 26 percent less than average. California lemons are estimated at 12.4 million boxes—3 percent less than last season and 2 percent less than average. Early and midseason oranges have been harvested except for about a million boxes of California navels. About 44 million boxes of Valencias were still available for use on **May 1**—16 million in Florida and 28 million in California. On May 1, 1952 about 42 million boxes of Valencia oranges remained

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Parathion For Control of Purple Scale on Early Varieties of Oranges

(Concluded From Last Issue)

HERBERT SPENCER AND
PAUL NORMAN (1)

Effect on Coloring and Fruit Quality

Harding (1950, 1953) has published findings from these experiments on coloring and fruit quality. Fruit from parathion-sprayed trees degreened earlier than fruit from unsprayed trees and much earlier than that from trees sprayed with oil. It was also definitely superior in total solids content. It met legal maturity standards earlier than did the oil-sprayed fruit. The depressing effect of the oil spray on degreening and on solids was much greater when it was applied in August than in June. Citric acid and ascorbic acid contents of the fruit were not changed by the parathion sprays but were lowered by the oil sprays.

Experiments in 1951-52

One question still remained to be answered after the cooperative experiment had been completed. It was whether lesser amounts of parathion per 100 gallons would give adequate control. If so, costs of spraying would be reduced for the growers. Grove 6, of Hamlin oranges, was retained for this supplemental experiment.

A prespray estimate of infestations in the seven treatment plots, made on June 20, showed 3.59 to 5.51 living purple scales per leaf, and the slight differences were not statistically significant. The same spray materials were used as in 1949 and 1950, but in some programs the concentration of parathion was reduced. Two applications were made to each plot on June 27 and September 10. All the sprays except the oil emulsion contained 5 pounds of 90 percent wettable sulfur per 100 gallons. The results, based on counts made on April 29, 1952, are given in table 2.

During the 10 months the experiment ran, the number of purple scales increased from 4 to 12 per leaf on trees that received neither oil emulsion nor parathion. Trees sprayed with oil emulsion in June and with wettable sulfur for rust mite control in September showed highly significant control, but by April 1952 the infestations had increased to nearly eight scales per leaf. A single spray in June containing either 1 or 2 pounds of 15 percent parathion per 100 gallons allowed too much fall build-up of purple scales. A single oil-emulsion spray in June was definitely inferior to parathion in June. Where either strength of parathion was used in September, infestations were low until April 1952, but there was a considerable build-up during the summer of 1951 before the late sprays were applied. Sprays containing 1 pound of 15 percent parathion per 100 gallons, applied in June and again in September, held a moderately light infestations to low levels throughout the year.

Cost Comparisons

In controlling purple scales on Hamlin or other early oranges, growers must consider the costs of proposed spray programs. Early and late oil-emulsion sprays are no longer thought to be desirable because of the detrimental effects of late oil sprays on the color,

TABLE 1. Number of Living Purple Scales Per Leaf on Early Varieties of Orange Trees Treated With Oil Emulsion and With Parathion, 1949-50.

Grove	1	2	3	4	5	6
Size of trees	Large	Small	Medium	Very Large	Medium	Large
			In 1949 Before Spraying			
Scales per leaf	6.85	4.59	8.10	8.55	5.39	2.62
Sampling date (1949)	June 15	June 15	June 16	June 16	July 22	June 29
			After 1949 Sprayings			
Programs—						
Untreated trees	21.40	31.92	2.95	15.62	2.60	27.34
Oil, June	12.61	11.37	2.73	8.74	2.93	22.38
Parathion + wettable sulfur, June	12.29	18.20	5.15	6.53	3.40	20.69
Oil, Aug.	13.24	9.00	1.12	3.75	1.62	14.23
Parathion + wettable sulfur, Aug.	12.56	13.90	.48	.28	.61	11.73
Oil, June and Aug.	5.17	6.41	.70	3.52	1.19	15.46
Parathion + wettable sulfur, June and Aug.	8.39	13.57	.17	.44	.13	6.32
Differences required for significance at—						
5% level	4.34	4.37	1.14	2.52	1.22	8.87
1% level	5.78	5.82	1.50	3.35	2.23	11.62
Sampling date (1950)	April. 12	Mar. 10	Jan. 18	Feb. 3	Feb. 28	May 22
			After 1950 Sprayings			
Programs—						
Untreated trees	24.45	29.14	12.42	27.70	3.47	18.02
Oil, June	3.55	1.38	.66	1.89	.51	10.57
Parathion + wettable sulfur, June	3.94	7.44	.45	3.17	1.31	7.20
Oil, Aug.	9.44	1.62	.72	5.33	.74	5.87
Parathion + wettable sulfur, Aug.	1.71	3.97	.37	.73	.32	2.28
Oil, June and Aug.	.85	.54	.13	.24	.06	2.82
Parathion + wettable sulfur, June and Aug.	.36	1.57	.05	.12	.08	1.99
Differences required for significance at—						
5% leval	4.06	4.17	.35	1.27	.24	3.15
1% level	5.42	5.56	.46	1.70	.32	4.19
Sampling Date (1950	Oct. 6	Nov. 3	Nov. 29	Jan. 11 1951	Jan. 29 1951	Dec. 18

TABLE 2. Effects of Reducing The Concentration of Parathion in Sprays, on Control of Purple Scales.

June spray	September spray	Number of scales per leaf
No oil or parathion in either spray		12.23
Oil (1.25%), no sulfur	No oil or parathion	7.88
Parathion (15%) 1 lb.	Parathion (15%) 1 lb.	1.18
1 lb.	No oil or parathion	4.01
2 lb.	No oil or parathion	4.18
No oil or parathion	Parathion (15%) 1 lb.	1.83
No oil or parathion	2 lb.	1.24
Differnce required for significance at	5% level	3.02
	1% level	4.03

(1) United States Department of Agriculture, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine.
(2) Paul L. Harding and Millard B. Sunday, of the Orlando, Florida, Laboratory of the Bureau of Plant Industry, Soils, and Agricultural Engineering, cooperated in the quality studies; grower cooperators were the Lake Region Packing Assn., W. J. Howey Co., and C. M. Stecher.

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maturity, and quality of the fruit. A single oil spray before mid-July does not prevent fall and winter infestations and, if used, should be followed by parathion plus wettable sulfur in the fall. However, since the oil emulsion cannot be added to the regular sulfur spray for control of rust mites because of its incompatibility, an extra spraying is necessary. Satisfactory control of purple scales may be had from early summer and fall sprays of parathion, which can be added to the regular wettable sulfur sprays applied at these times for rust mite control.

Costs of materials for these experiments were 31 cents per gallon for the oil emulsion and 45 cents per pound for the 15 percent wettable parathion. The cost of the extra application, where oil emulsion was used, was $1.35 per 100 gallons. Program costs were calculated on the basis of cost of materials per 100 gallons, excluding the rust mite control, which would be the same for all programs. On this basis the early oil plus late parathion schedule cost 47 cents for the oil, $1.35 for the extra spraying, and 45 cents for the parathion in the fall spray, a total of $2.27 for the year. Two one-pound applications of parathion cost 90 cents; two two-pound sprays cost $1.80 for materials for scale control. The cost of control was less with two applications of parathion than with the early oil plus late parathion sprays for heavy infestations, even when the heavier concentration of parathion was used.

Parathion Residues

Boxes of Hamlin and Parson Brown oranges were picked in December 1949 for analyses of parathion residues on the fruit skin, in the peel, and in the juice. These analyses[3] show that 4 months after the August sprayings and 6 months after the June sprayings less than 0.01 part per million of parathion remained on the fruit skin. There was no parathion in the juice, the edible portion. However, there were traces in the orange peel, even after 6 months. The amount, when calculated on the basis of total weight of fruit in the sample, ranged from 0.18 to 0.62 parts per million. If calculated on the basis of the weight of the peel alone, the amount in the peel did not exceed 2.89 parts per million. Most of the small amount of peel that is used in cattle feed is processed by heat, so this quantity of parathion is not thought to be potentially dangerous. In these analyses and in those made for other experiments no parathion was found in the fruit juice, even when two sprays containing heavy concentrations were used each year.

(3) By Jack E. Fahey, of the Vincennes, Ind., Laboratory, Bureau of Entomology and Plant Quarantine.

Summary

Cooperative experiments were undertaken in Florida in 1949 to compare oil emulsion with parathion for the control of purple scales on early varieties of oranges.

Parathion added to rust mite sprays of wettable sulfur in June and August controlled purple scales, Lepidosaphes beckii (Newm.), as well as did oil emulsion sprays applied at the same times. Single sprays, either of parathion or of oil, did not give year-around control. Two pounds of 15 percent wettable parathion per 100 gallons of spray, in June and in August, controlled heavy infestations of purple scales, but with moderately light infestations in 1951, one pound applied in June and in September was sufficient.

Cost of control was less with

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Entomologists To Use Radioactive Insects, Insecticides In Study Of Insects . . .

Entomologists of the U. S. Department of Agriculture are planning new uses of radioactive insects and insecticides to find out how insecticide kills an insect, and just far and how fast insects fly, how an how some insects (particularly houseflies and roaches) develop resistance to insecticides.

Since insects do great damage themselves, and often carry diseases of plants, humans and animals, the knowledge of how far they may travel in a known time helps the entomologist in insect control. An insect (or insects) "tagged" with one of the radioisotopes can be detected by a counting mechanism, even when out of sight . . . for example, under the bark of a tree. Similarly, a "tagged" insecticide can be traced into an insect's small body to see what physiological changes take place . . . or perhaps fail to take place as an insect develops resistance to an insecticide.

For example, J. M. Davis, entomologist at the Agricultural Research Center at Beltsville, Md., will "tag" the destructive bark beetle with a radioisotope of scandium, one of the lesser known chemical elements, which emits a powerful gamma ray. Weak trees tc which such beetles naturally fly, located at various distances from the point of release, may be used as natural traps to check distances beetles migrate. "Seintillation counters," which are sensitive to gamma rays will, Mr. Davis believes, reveal presence of the treated (radioactive) insects that have burrowed beneath the bark and even as far as six inches into the tree "traps".

Radioactive blowflies released in previous Bureau of Entomology and Plant Quarantine experiments in the West were detected by Geiger counters in traps 20 and 28 miles from the point of release.

F. H. Babers, a Bureau biochemist, will use radioisotopes in learning more of how various insecticides kill insects, and how such insects as houseflies and roaches develop resistance to insecticides. After applying a radioactive insecticide to such an insect, he can follow its route into and through the insects's body, nervous and digestive system, and its final excretion from or storage in the insect's body. Photographic plates and other radiation detection devices will give progressive pictures of the penetration or absorption of the insecticide. Radioisotopes already have proved their value in studies of minute physiological changes within the bodies of insects.

Radioisotopes are used to determine the abundance of insects. When radioactive female insects, which will lay radioactive but otherwise normal eggs, are released the ratio of radioactive to normal egg masses later collected gives a fair key to the insect population in the area. This method is being used in Florida to determine screw-worm population densities.

Radioisotopes may later be used to find out just how systemic insecticides are distributed in plants. They are being used in studies of how hive-destroying bee diseases spread, and of the complex relations various castes of bees within the hives have to the production of honey.

Sanibel Island, a 14-square-mile island off the southwest coast of Florida, is the locale of an experiment in control of screw-worm flies, which cause stock losses in the United States estimated at $25 million annually.

Male flies sterilized by gamma rays are released from planes over the island and adjacent areas. Female screw-worm flies mate only once, and any females that mate with such sterile males lay eggs that will not hatch. This work with gamma rays was carried on by R. C. Bushland and D. E. Hopkins, of USDA's Bureau of Entomology and Plant Quarantine, in cooperation with Oak Ridge (Tenn.) National Laboratory. Extended experiments will be needed to show whether such adapted biological control is economically feasible for screw-worm control.

Work with radioactive materials requires many precautions, protective clothing, strict accounting for materials, and careful disposal after use. Workers check their own exposure to rays by carrying photographic plates in their pockets. A fogged plate indicates faulty technique and calls for a speedy change in methods of handling radioactive material.

THE CITRUS OUTLOOK AND PRODUCTION

(Continued from Page 11)

for harvest—16 million in Florida and 26 million in California. Very few midseason oranges were available in either State a year ago. Only about 5 million boxes of grapefruit were available on May 1 this year compared with about 12 million a year earlier of which 9 million were utilized.

The **Texas** citrus areas received very little rain during April. Regular irrigation districts have been short of water and many groves have been irrigated from private wells. **California** citrus trees are generally in good condition. All varieties of California citrus experienced a long blooming period and April frosts probably killed some of the open blossoms. However, prospects for the 1953-54 crops are favorable. Most areas received beneficial rains on April 26 and 27.

Citrus Doings In California

W. C. PEDERSEN
PRESIDENT WAVERLY GROWERS COOPERATIVE

Word comes to us from California that some interesting facts were brought out at the hearing on the movement to put California and Arizona Navel oranges under volume and other controls. The proponents of the new order argued that the Navel is so different from other oranges that it stands by itself. The opposition to the bill wanted to know if Florida oranges were not also eaten out of hand.

The record introduced was a survey in 1951 that showed California Navel oranges 75% eaten, 5% sliced and used in salad, and 20% used in juice by consumers, while Florida's were 31% eaten out of hand, 6% sliced and 63% reamed into juice.

Someone wanted to know if, because of the great increase in the overall volume of Florida oranges shipped, it might be a fact that more Florida oranges might have been eaten than California's. I was somewhat surprised that the report showed there were 1% more Florida oranges sliced and used in salads than California's.

The hearing brought out the fact that there were 79,700 acres of California winter oranges owned by about 10,000 growers. This would mean that the average grove was less than 8 acres—quite a little different from Waverly's average of about 28 acres per grower.

California has been taking advantage of the USDA subsidy of export shipments. So far this year they have shipped abroad 1,703,420 boxes, compared with 779,819 boxes shipped last year.

It has only been a few years since California orange growers were showing a great preference for the Valencia variety. There were hardly any Navel groves being set out. The big demand was for fresh oranges that could be used for juice. The Navel orange was not a very good juice orange.

Now that Florida fresh frozen concentrate has taken such a hold on the public, California Valencia oranges no longer have the market to themselves during the summer and early fall months. They must split the market with Florida's frozen concentrate. The cost of producing oranges in California is so much greater than in Florida, and it is difficult to use California Valencias in fresh frozen concentrate without adding sugar. This makes it very hard to compete against the Florida product.

Fresh Fruit shippers in both Florida and California will have to keep on the job with promotions and advertising if they are to keep up their volume of fresh fruit shipments. All fresh fruit and produce are feeling the competition of frozen products.

The United Fresh Fruit and Vegetable Association, which is a national organization with a larger membership than any other affiliation of produce handlers, is going all out to encourage the use of fresh fruit and vegetables. It is promoting with dollars the "Fresh for Health Foundation" campaign. The initial project calls for a minimum of 400,000 cars that will be pledged to support this promotion. Shippers will contribute 25c per car and brokers 5c per car. The program is off to a good start and is getting good support.

Notes Of The Trade

C. L. Remington, state manager for Geigy Co., Inc., has just announced the appointment of Dr. Jay Wright, Ph. D., as technical director of research for his company in Florida.

Remington states that Dr. Wright has a sound background of training and practical experience in the state where he says he will be valuable to the company's operations in Florida.

Remington also calls attention to the new mite killer for use on ornamental plants and agricultural crops which his company is offering in the state, known as Chlorobenzilate. He states that the product is effective against a wide range of mites and red spiders and says it is suitable for use of a large number of plants, vegetables and melons.

Chlorobendilate is available as a 25 per cent emulsion concentrate, a 25 wettable powder and a 3 per cent dust. Among the most important test data reported by Remington were those on mites in the large apple growing regions of the United States, where he reports, one pint of emulsion or one pound of the wettable powder provided excellent control.

The LYONIZER

Department

COMPILED BY THE LYONS FERTILIZER COMPANY

Reports Of Our Field Men . . .

HIGHLANDS AND POLK COUNTIES

J. T. Griffiths and J. K. Enzor, Jr.

Weather became sufficiently dry by the 18th to require irrigation in the Lakeland and Polk City sections of Polk County and resets required water throughout the County at the same time.

Crop set in Polk County appears about the same as a month ago, with mid-season varieties a little spotty, grapefruit similar to last year, and Valencias with a generally good crop set.

Summer fertilizer applications will have been applied in most groves by June 5.

I would like to call to the growers' attention an article by Mr. Savage in Citrus Magazine which demonstrates, among other things, the desirability of maintaining high levels of fertilization as a means of attaining the greatest net returns per acre.

Scale is common in many groves. All sprays should be delayed until after the first of June, and preferably until after June 15. It is desirable to substitute parathion where high solids are desired. There are many groves which will require at least two scalicides in order to clean up the scale infestations which are now present.

Rust mite are slowly building up, but are as yet no major problem in most groves.

SOUTH POLK, HIGHLANDS, HARDEE AND DESOTO COUNTIES

C. R. Wingfield

The summer fertilizer application started early in May but many of the growers, as of this writing, have had to turn their attention to irrigation. Some of this section has had more rain than others and are in a better moisture condition but if some relief does not come by the time of this publication most all irrigation plants will be in operation.

The new crop still appears to be rather spotted. The lighter crops look like it will be in the midseason fruit. As growing conditions have been fairly good the size of the fruit looks very good unless it is retarded by the dry weather.

With only a very few crops of Valencias unsold the season is fast coming to a close. The prices are remaining as they have been for the past 30 days.

NORTH HILLSBOROUGH AND PINELLAS COUNTIES

J. A. Hoffman

Hot windy days this past month has dried most of the moisture out of the ground and groves are beginning to go into a wilt at this time. Some growers have found it necessary to irrigate, while others will start if it doesn't rain in the next few days.

The summer application of fertilizer has been underway since the first of May and should be over by the middle of June, being delayed by the dry weather.

SOUTHWEST FLORIDA

Eaves Allison

A right smart dropping has occurred in the new citrus crop but there still remains a lot on the trees. Dry weather has increased the loss somewhat, with a few trees showing wilt here and there. However there has been no serious lack of moisture yet but irrigation plants have begun to run pretty steadily.

Farm crops are picking out their last at this time—May 15th—with sweet corn and pole beans gone and cukes and tomatoes going fast. Celery is finished after a pretty disastrous year as far as prices and profits go. Some vegetable growers made a little net money for the year, but most of them failed to pull out of the hole on what was a pretty good Spring season. The Fall losses were a little too heavy a load for what Spring profits there were! Watermelons from the southern area have not done too badly, with a much larger acreage.

Good fertilization programs are more important than ever in times like these, and our Lyons customers have nothing to complain about on that score!

WEST CENTRAL FLORIDA

J. E. Mickler

Hot weather and cold melons: that is the main thing at this time. Melons are beginning to roll in this section and the price has been rising each day. Those that were fortunate to nurse some thru wind, rain, and all the blights that beset the grower this spring will reap the harvest. Vines are fast going and some will realize only one picking. Those few fields that poured the fertilizer and top dresser to the melons will more than profit.

The Summer applications are winding up and grove owners will watch the Indigo take over for the Summer. Rust Mites have been in force and dusting has been the main control. A few six spotted mites have been seen too. While the weather is dry and no rain in sight, the trees are in good shape. The fruit are sizing up very nicely.

NORTH CENTRAL FLORIDA

V. E. (Val) Bourland

Weather is dry and hot through the day with cool nights. Groves are looking very good, young fruit is sizing up nicely, but there seems to be light crop of early and midseason. Valencias that are ready to pick are beginning to green up, and the growers are undecided about selling at the present price. Some are putting on their summer application of fertilizer, and cultivating groves. Insects have been very bad this spring which has required a large amount of insecticides to keep them in check.

PASCO AND HILLSBOROUGH COUNTIES

E. A. McCartney

We have not had any rain for so long that it is becoming quite serious in my territory. Growers are irrigating night and day. Early and mid-season fruit have been dropping badly and there will be a light crop next season. Grapefruit and valencias have set more fruit.

The prices hoped for on valencias have not yet materialized. $1.50 to $1.65 on the tree is the best yet.

Summer fertilizing has been heavy the past three weeks and should be over by about June 20. High nitrogen and low potash is becoming more popular with the citrus growers.

SCRAPS FROM MY NOTEBOOK

(Continued from Page 10)

not so good on grapefruit. The bitter tang which is so well liked when grapefruit is added to orange marmalade was not liked in the syrup.

After the enthusiastic reception in the consumer acceptance tests I made up ten thousand gallons of orange and tangerine syrup and quickly sold all of it in Lakeland and Tampa. Tests had shown that the color darkened when packed in glass and exposed to the light for a few months so all of this lot was put into plain No. 2 and No. 10 cans. Tourists bought a lot of it, particularly at the Morrison cafeterias where it was served on hot cakes and waffles and sold in No. 2 cans. For ten years after that I got letters from the North, wanting to know where they could get it. Before the next fruit season the banks failed and I lost everything I had. Since that time I have made these syrups only for the family and for friends at Christmas.

Anyone with a kitchen stove and a dish pan can make this syrup. It keeps much better than cane syrup and its appealing fragrance and flavor make it a better seller. It holds its ascorbic acid (vitamin C) well but this is so diluted by the sugar that it should not be stressed as a selling point.

The peel that is used in making the syrup cannot be used in marmalade after it has been in the syrup because it becomes tough when it is put into the hot syrup. I have not been able to cook it tender, even in a pressure cooker, without caramelizing the sugar and changing the flavor. It can be ground to a paste in a comminutor and used for cake filling and sundae topping. If the peel is cooked tender before adding it to the sugar syrup, as is done in making marmalade, it gives little flavor and aroma to the syrup.

This is a product that is easily made and requires little equipment. If it were produced in quantity it would make use of a lot of small tangerines and oranges and would keep a lot of syrup money in Florida

A small amount of dextrose or corn syrup can be blended with these citrus syrups but if too much is added the product will crystallize.

CITRUS INSECT CONTROL FOR JUNE, 1953

(Continued from Page 3)

spot. Sufficient spray or dust must be directed to the tops of the trees to obtain thorough coverage. The most effective spray is a combination of ¾ to 1 gallon of lime-sulfur plus 5 pounds of wettable sulfur per 100 gallons. Wettable at 8 to 10 pounds per 100 gallons can be used, or for light infestations, a sulfur dust. Where not more than 5 percent of the fruit is infested at the time of the application, an oil spray will check infestations for two to four weeks, or until it is safe to apply sulfur. If it is found that 15 to 20 percent of the fruit are infested, then the grove should be sprayed with sulfur before an oil application, and it will then be necessary to wait for two to three weeks or until the sulfur is washed off before an oil spray can be applied. A thorough application of a sulfur spray using the minimum concentration will be more effective than using a higher concentration with a less thorough application.

For more detailed information refer to the 1953 "Better Fruit Program" or consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

THE FIRST CITRUS JUICE EXTRACTORS

(Continued from Page 9)

life work to citrus problems on the techcnical side and is still active as an associate at Thornton Laboratories in Tampa. While attending to his other duties at Haines City, Mr. Walker made the first experiments in drying citrus peel and refuse for cattle feed. Thus was started the technical knowledge that led to the development of another vast industry.

In addition to the officials of this first plant who gave freely of their resources and efforts in pioneering a new venture, I would like to give due recognition to the following key men Who helped make the undertaking possible.

My brother, William E. Street (deceased) who was assistant to J. P. Angle, Sr., in Office Management and General Administration.

William Sheffield, now residing at Tampa, Plant Engineer.

Lewis B. Angle, now residing at Tampa, Florida, Department Supervisor and my assistant at a branch plant established later at Miami, Florida, in 1917.

Harley B. Angle, Haines City State Bank, Processing Supervisor.

George Washington Gallishaw (deceased), a faithful negro and handy man.

By their contribution to this early endeavor these men wrote their names on the first history pages of the citrus processing industry.

PARATHION FOR CONTROL OF PURPLE SCALES ON EARLY VARIETIES OF ORANGES

(Continued from Page 13)

two applications of parathion than with oil emulsion, because parathion can be added to regular rust mite sprays, whereas oil-emulsion sprays are extra, oil-emulsion not being compatible with sulfur.

Parathion residues at picking times were present in the orange peel, but no trace was found in the juice.

Oil emulsion sprays applied in August retarded coloring of the fruit, lowered total solids (sugars) in the juice, and delayed the time of reaching legal maturity standards. Parathion in the August spray allowed fruit to color and mature normally.

From these experiments control of purple scales with parathion appears to be a definite improvement

(Continued on Next Page)

Classified Ads

Grapefruit And Advertising . . .

W. C. PEDERSEN
PRESIDENT WAVERLY GROWERS COOPERATIVE

Some of the larger canneries have been selling canned grapefruit juice at about 20c per case less than they have previously sold it.

It is hard to see why this is necessary, but when a few get panic-striken, the rest follow like sheep. The situation with grapefruit is not good, but it seems that with prospects of about a million less cases of grapefruit juice being canned this year than last, some way might be found to keep the price up so that the grower might get a fair profit.

With the price of juice being reduced to $2.05 per dozen 46 ounce cans, it means that the grower would get about 65c to 70c delivered to the cannery for his product. Sixty-five cents delivered is just about production costs. Of course, sections and fresh fruit are still bringing more money than the fruit sold in the form of canned juice.

Surely there is something wrong about the prices paid for our grapefruit crop when we have it practically all our own way, with Texas out of the picture and own crop several million boxes short. Perhaps some of Mutual's growers who voted for no additional promotion money should take another look at the situation, and growers who grow a majority of oranges should be eliminated from voting on the grapefruit issue.

It is true that there are millions of dollars spent by commodity and brand advertisers for oranges, and this dwarfs the few hundred thousand dollars spent on grapefruit advertising. Texas is getting back in the picture, aid if we give up now, we might as well kiss the Florida grapefruit deal good-bye and turn it over to Texas.

A half a grapefruit is still the most inviting thing on the breakfast table, and why let propagandists persuade the public to switch to anything else? We must call the public's attention to uses of grapefruit. It is the most reasonable priced juice product on the market. Why cannot we have a greater movement?

There is only one answer, and that is, someone alse is getting our business. The grapefruit growers have got to get in and fight for their share of the market. It takes money to fight, so if grapefruit growers want to stay in business, they better be willing to spend more money to promote their product.

PARATHION FOR CONTROL OF PURPLE SCALES ON EARLY VARIETIES OF ORANGES

(Continued from Preceding Page)

over that with oil-emulsion sprays formerly used on early varieties of oranges.

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WILLING TREES JUST AREN'T ENOUGH

Your citrus trees are willing to produce a lot of good fruit for you, but if they are to do the sort of a job you want them to they must have help in the form of proper and adequate plant food, cultivation and the other cultural practices which have been found to be effective.

LYONS FERTILIZERS Produce Maximum Crops Of Highest Quality

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